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This list should not be viewed as required or NMED-endorsed methods for ozone control strategies for the San Juan County Early Action Compact once submitted to the Environmental Protection Agency in June of 2003. The list only represents possible strategies to control ozone formation and can change in the future, based on what scientific studies indicate is needed to reduce ozone formation within San Juan County.

Control Strategies for Ozone Formation in
San Juan County

1. Reformulated Gasoline

Reformulated gasoline (RFG) is gasoline blended to burn cleaner and reduce smog-forming and toxic pollutants in the air we breathe. The Clean Air Act requires those metropolitan areas with the worst smog problems to participate in the reformulated gasoline program. Many communities and states also have chosen to participate in the RFG program to meet pollution reduction goals of the Clean Air Act. Phase I of the reformulated gasoline program made great progress. Between 1995 and 1999, it cut smog-forming pollutant levels by about 17 percent compared to conventional gasoline in communities where 75 million people live and work. Phase II, which began January 1, 2000, took another step toward cleaner air. It reduces smog-forming pollutants 27 percent more than conventional gasoline.

2. Inspection and Maintenance Programs

Inspection and Maintenance (I/M) is a way to check whether the emission control system on a vehicle is working correctly. All new passenger cars and trucks sold in the United States today must meet stringent pollution standards, but they can only retain this low-pollution profile if the emission controls and engine are functioning properly. I/M is designed to ensure that vehicles stay clean in actual customer use. Through periodic vehicle checks and required repairs for vehicles that fail the test, I/M encourages proper vehicle maintenance and discourages tampering with emission control devices. Substantial reductions in vehicle emissions are necessary for many areas to attain clean air. Depending on the sophistication of the program, I/M can reduce vehicle-related hydrocarbon and carbon monoxide emissions by 5 percent to more than 30

percent. A comprehensive I/M program can also yield reductions in nitrogen oxide emissions of up to 10 percent.

3. Stage II Gasoline Vapor Recovery Regulations

Gasoline dispensing pump vapor control devices, commonly referred to as Stage II Vapor Recovery Control, are systems that control volatile organic compound (VOC) vapor releases during the refueling of motor vehicles. This process takes the vapors normally emitted directly into the atmosphere when pumping gas and recycles them back into the fuel storage tanks, preventing them from polluting the air. The Stage II system controls the release of VOC, benzene and toxics emitted from gasoline.

4. Volatile Organic Compound (VOC) Control Regulations

VOC's react with nitrogen oxides on hot summer days to form ozone (smog). Car exhaust, gasoline-powered lawn and garden equipment, gasoline dispensing stations, industrial coating operations, printing shops, paints, household chemicals - are some of the sources of VOC. These emissions can be reduced by making process changes (such as switching to low VOC content coatings) or by installing air pollution control equipment (such as carbon adsorbers or incinerators) State VOC regulations have to at least meet a level of stringency we call RACT, or Reasonably Available Control Technology. RACT is defined as the lowest level of emissions that can be achieved taking into account technical and economic considerations. EPA provides guidance on RACT in documents called Control Technique Guidelines. EPA reviews and comments on proposed State regulations during the state's public hearing process to ensure that these rules meet RACT and will achieve the emissions reduction projected. Once the state has adopted the VOC rule, EPA approves the rule into the state's State Implementation Plan (SIP). The state's VOC rule then becomes federally enforceable.

5. Nitrogen Oxides (NO_x) Control Regulations

Nitrogen Oxides are a family of poisonous, highly reactive gases. These gases form when fuel is burned at high temperatures. NO_x pollution is emitted by automobiles, trucks and various non-road vehicles (e.g., construction equipment, boats, etc.) as well as industrial sources such as power plants, industrial boilers, cement kilns, and turbines. NO_x often appears as a brownish gas. It is a strong oxidizing agent and plays a major role in the atmospheric reactions with volatile organic compounds that produce ozone (smog) on hot summer days. These emissions can be reduced by making process changes (such as modifications to the combustion process) or by installing air pollution control equipment (such as selective non-catalytic reduction (SNCR) or selective catalytic reduction (SCR)).

6. Industry-wide emission standards

Rather than setting emission caps individually for each facility, industry-wide emission standards replace equipment permitting for an entire industry. Industry-wide emission standards have been successfully demonstrated in Massachusetts, where the Environmental Results Program showed that industry-wide permitting could produce greater compliance and greater environmental benefits than the traditional approach to piecemeal permitting.

7. Emission-trading programs

In emission-trading programs such as the national sulfur dioxide trading program, or the reclaim volatile organic compound trading program, an emission cap is established over an area, emission rights are established, and a system is designed to allow trading in those emission rights between firms within the capped area. California's Bay Area Air Quality Management District has also implemented an emission pricing regime, allowing trading in Bay Area Emission Reduction Credits. One relatively untapped option would allow trades between mobile and stationary sources, for example, through automobile repair-assistance or scrappage trading programs.

8. Self-audit and cleanup incentives

Another approach to attaining better environmental performance is to encourage firms to voluntarily adopt environmental management and information programs, such as the International Organization for Standardization (ISO 9000) standards, the Coalition for Environmentally Responsible Economies (CERES) principles, the Global Environmental Management Initiative (GEMI) principles, and others. Such an approach has been adopted in Oregon, with the Green Permits/Environmental Management Systems Incentives Project (EMSIP). One other example is the Chemical Manufacturers Association (CMA) Responsible Care initiative.

9. Incentives for retrofit of generators for peak power units

There have been demonstration projects that show potential to reduce nitrogen oxides emissions for diesel applications including generators. This includes selective catalytic reduction (SCR) strategies for peak power generators, and are available for new and retrofit models.

10. Broad-based energy and resource efficiency programs

In Toronto, they have adopted a Greenhouse Gas (GHG) Pilot Trade program that provides credits for an array of energy and resource conserving activities that help reduce energy use and thus power production and emissions. Credits are provided for efficient street lighting, landfill gas recovery, waste reduction and recycling, water conservation, carbon sequestration (tree planting), community greening, building code amendments, bicycle infrastructure, land use for energy efficiency, alternate cooling technologies, and transportation demand management strategies.

11. Connected street system or pedestrian pass-throughs

Portland has street design guidelines that require streets to intersect within particular distances and restricts cul-de-sacs (which waste gas by requiring drivers to backtrack out the streets to progress). Where cul-de-sacs and similar developments exist, pedestrian walkways or pass-throughs are encouraged to assure pedestrians can use short cuts to get to mass transit or shopping areas. Oregon has other sprawl strategies; options and credit programs are being implemented or studied in Chicago and California.

12. Credits for scrapping old automobiles

In California, credits have been made available for removing old automobiles from operation—automobiles that have a disproportionately negative impact on air quality. These schemes have

been successful in removing high-polluting vehicles from service (although there have been some glitches in the system), and the credits have been used to offset more expensive emission retrofits for industry in the state. Overall, this has helped reduce emissions at a lower social cost.

13. Expanded or enhanced credits for purchase / replacement of vehicles / engines

A credit system, similar to those established for scrapping high-polluting automobiles, could be established for replacing high emitting automobile or diesel engines with lower polluting engines (e.g., alternative fuels, diesel hybrid engines, etc.) could be established. The credits would be performance-based in their values (rather than technology based), could allow for alternative fuels (where appropriate). The credits could be banked, applied against other retrofit opportunities, or traded/sold. This credit should apply to purchase / upgrade of automobiles, construction equipment, diesel vehicles, marine equipment, and other engines.

14. Legalization of after-market emission reduction technologies

EPA-favored inspection and maintenance programs focus on returning the tested vehicles to the exact operating condition that they had when they were new, right down to requiring original equipment. After-market emission-reduction devices exist that allow cars and off-road diesel equipment to perform better than when they were new. Inspection and Maintenance protocols should focus on getting the best performance out of each car, not simply the performance it had when new.

15. Incentives for retrofits for revised fuels or technologies to improve diesel operations

Incentives could be developed to encourage adoption of new or retrofit technologies that reduce emissions in on- and off-road vehicles. There have been demonstration projects that show potential to reduce nitrogen oxides (NOx) emissions for diesel and large-emitting vehicles, including construction applications. This includes selective catalytic reduction (SCR) strategies for generators for construction units (and peak power units), and in some trucks. The truck models perform best in new equipment rather than retrofit, although the generators can be successfully retrofitted. Emulsified diesel fuel also shows promise, including marine applications. Increasing the cetane level in the diesel fuel (e.g. through additives) –shortens the time between compression and ignition and improves cold start emissions. Some municipalities are specifying 5 percent improvements in NOx and 1 cent per gallon cost increases to get particulate matter 10 microns in size and less reductions.

16. Traffic control measures to reduce congestion-related emissions

Such measures might include traffic signal synchronization, additional tolled road construction, incentives to promote telecommuting and flexible work-hours, and could include time-of-day congestion pricing in certain circumstances.

17. Incentives or credits for modifying diesel vehicle operation

Incentives could be provided that would help manage truck diesel emissions by managing diesel speed, and the path vehicles. For example, trucks might need to be diverted on an episodic basis to alternate roads that run "around" the city, rather than through it. Firms or fleets that agree to permanent rerouting might be another target, but abuse might be a consideration.

18. Market-based shuttle van transit systems

Mass transit programs are promoted as a method of reducing vehicle use and vehicle emissions by providing alternatives to solo driving. But traditional mass transit programs are largely ineffective at cleaning the air, and may actually make the problem worse by increasing traffic congestion. Reason Public Policy Institute has developed an alternative transit plan, which uses privately owned and operated shuttle vans running over a highway system with either High Occupancy Vehicle lanes, or High Occupancy / Toll lanes. Shuttle transit has been shown to be competitive with mass transit in some foreign countries. In the United States, consumers have experience with van shuttle transit in the form of hotel shuttles, airport shuttles, tourist shuttles, and employment-related vanpooling.

19. Limiting or shifting hours for government workers

Limiting or shifting hours for some kinds of workers can cause difficulties in terms of safety and cost. However, shifting and limiting hours for most types of government workers may be more effective than other sectors, and may have far fewer secondary impacts. These workers may be shifted from 12 noon to 8 pm shifts or may be provided incentives to do so; additionally, incentives for teleworking (including easier home office tax considerations, etc.) may assist the Houston area in meeting attainment levels.

20. Employer tax incentives or credit programs for encouraging telecommuting or commuter alternatives

Government can offer tax incentives for employers to modify benefits packages for employees to encourage transportation alternatives—including car/vanpooling, walking, biking, mass transit, etc. The federal "Commuter Choice" program (National Transportation Equity Act for the 21st Century) provides pre-tax benefits for paying up to \$65 of transit, or cash outs of up to \$175/mo for parking spaces. This is currently in use, and some states have enhanced these benefits, including Maryland, California, Washington, and others. Options for rides home for emergencies must be available, and evidence indicates there is not abuse of the system. These incentives for telecommuting can either stand alone and be offered by Texas government, or be offered by companies and used as partial offsets in an emission trading regime. New Jersey has an employer trip reduction emission credit program, and employers submit three page plans outlining the trip reduction plan and get emissions credits that may be bought and sold.

21. Time-of-day / congestion parking pricing

Parking pricing can be set much higher during periods during which driving is to be discouraged in order to encourage use of mass transit, off-peak time driving, or use of multiple occupancy vehicles. In addition, parking prices can be set much higher for single occupancy vehicles and much lower for high occupancy vehicle lanes. Employer parking buy-out strategies are addressed elsewhere.

22. Clean screening and high-emitter detection with remote sensing

A minority of cars on the road produces the majority of mobile-source pollutants given off by the entire vehicle fleet. Rather than subject a mostly-clean vehicle fleet to scheduled emission testing with costly, stationary dynamometer equipment, we suggest programs that use lower-cost mobile emission detectors to allow repair efforts to focus on the high emitters, the core of the

automobile emissions problem. Clean screening uses both roadside sensors and an understanding of new-car emission characteristics to exempt the bulk of the on-road vehicle fleet from the need for inconvenient, and sometimes costly annual emission testing. Cars less than four years old are unlikely to be high emitters. Studies suggest they are less than 1 percent of the high emitters on the road. Exempting cars newer than four years old removes a large percentage of the vehicle fleet from the test regime, allowing the concentration of effort on the remaining, more-likely high emitters. Using remote sensors to detect which of the cars older than 4 years is clean can also be done with high accuracy, allowing yet more focus on the remaining high-emitters. Finally, roadside sensing of high emissions allows the car to be repaired immediately. An annual test does nothing to repair cars that break a month after their last annual test. Those cars can emit at high levels for another 11 months, even 2 years, before being repaired.

23. Emission check buy-out

In California, as an example, owners may pay a fee to avoid smog checks for the first five years of owning a new car. This can be an appropriate strategy because the minority of pollution is emitted from new automobiles, and the problem is disproportionately one generated from older vehicles. By paying a fee to bypass the checks (e.g. \$4/vehicle in some areas), the fee can be used to lower fees for other vehicles, or other appropriate uses may be made with the funds (contributions to a "smog fee/fund"). This strategy assures that similar emissions will be realized, but at lower cost in terms of administration, time waiting, inconvenience, and inappropriate retrofits to new automobiles.

24. e-Government and Improved Accessibility to Services

This strategy involves establishing mechanisms which allow citizens to utilize government services via the internet—vehicle registrations, bill paying, permits, etc. Making these services available reduces traffic congestion and vehicle miles traveled. Governments can also achieve these benefits by, where feasible, increasing the number of locations for providing services.

25. Land Use and Transit-Oriented Development

Local governments implement development criteria either requiring or providing incentives for sprawl reduction such as vertical zoning, mixed use zoning, enhanced mobility choices, reducing distances between home sites, work sites, and service sites. These types of development criteria will reduce the impacts of new development on air quality.

26. Tree Planting

Trees remove pollutants from the air and can provide shade to impervious surfaces, reducing “urban heat island” impacts (i.e., lowering temperatures). Adding trees to parking areas can be particularly effective in reducing these impacts. In addition to the cleansing action trees provide in removing pollutants, the shade-induced lower temperatures reduce cooling and energy consumption requirements. Tree planting programs can be effective tools in saving energy and improving air quality.

27. Lawn and Garden – Low Emission Gas Cans

Gasoline-powered lawn and garden equipment are a significant source of volatile organic compounds in the region. A particularly effective control measure is the use of non-permeable,

spill-proof gasoline containers. An estimated 0.2 tons per day of VOC reductions could result from 100% use in the commercial sector.

28. Incentives for Adopting New Technologies (or removal of tax and regulatory barriers to introducing new technologies)

Providing incentives for adoption of new technology can help accelerate the adoption of lower-polluting technologies, replace or retrofit high-polluting fleets, and provide incentives for improved operation of vehicles. Incorporating emission budgets or incentives into construction contracts, for example, could provide incentives for advancing vehicle turnover and off-road engine turnover or retrofit with newer technologies, reducing emissions. A wide range of mechanisms is available, and many have shown promise in other locations.

29. More Efficient and Discerning Methods for Inspection and Maintenance Procedures

This control strategy can maintain improved emission levels at lower costs. Using new technology to find non-complying vehicles on the road, and focusing inspection efforts on that segment of vehicles expected to have higher emissions, or allowing emission check exemptions for newer vehicles can provide greatest benefit at lower administrative cost and lower inconvenience to (relative) non-polluters.

30. Voluntary Employer Incentives

Encourage employees to use alternatives to commuting, including parking cash-outs, tax incentives, and creative tradeoffs in benefits packages. Such approaches have performed well in other locations and provide incentives in the private sector and at needed times of day. Incentives can also be provided that encourage the viability of private automobile-sharing cooperatives that help make it practical to avoid automobile ownership for many.